

CLAIMS

I/We claim:

- [c1] 1. A method of read/write operation in a RAID-5 configured storage system having a RAID controller, a RAID cache memory, a plurality of physical disks, and one or more logical disks, the method comprising:
- reading data from said logical disk;
 - writing data to said logical disk;
 - flushing data from said cache memory to said logical disk when the RAID controller is idle; and
 - otherwise performing read/write operations under the control of the RAID controller to the cache memory.
- [c2] 2. The method of Claim 1 wherein the writing process comprises:
- reading an old data block and an old parity block from said logical disk or said RAID cache;
 - forming a new parity block and a new data block by computing an XOR with the new data and the old data block and the old parity block;
 - updating the logical disk by placing the new data block and the new parity block in the RAID cache or the logical disk.
- [c3] 3. The method of Claim 2 wherein the step of updating the logical disk comprises:
- finding a buffer of a physical disk number and a physical block number in the RAID cache memory by a search algorithm;
 - allocating in the RAID cache memory a buffer area in the case when the physical disk number and the physical block number cannot be found; and

writing data to the allocated buffer area and setting the allocated buffer area as a dirty buffer in the RAID cache memory.

[c4] 4. The method of Claim 1 wherein the reading process comprises:
determining whether an old data block to be read is already stored in the RAID cache memory, and if so, reading said old data block from said RAID cache memory; and
if said old data block is not stored in the RAID cache memory, allocating a read buffer area from said RAID cache memory and transferring said old data block from said logical disk to said read buffer area and reading said old data block from the RAID cache memory.

[c5] 5. The method of Claim 4 wherein said read buffer area is a non-dirty and least used block within the RAID cache memory.

[c6] 6. The method of Claim 1 where flushing the cache memory comprises:
selecting the dirty buffers in the cache memory;
writing the dirty buffers to the logical disk; and
setting the dirty buffers as a clean buffer in the RAID cache memory.

[c7] 7. The method of Claim 3 wherein the allocating a buffer process comprises:
flushing cache memory to the logical disk if no clean buffer is found in the RAID cache memory; and
selecting the least used buffer in the RAID cache memory for allocation.